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## IMPORTANT DATES:

- FHP Conference  
9-15 August 2008
- ATACCC Conf.  
11-13 August 2008
- HFES Meeting  
22-26 Sept. 2008
- ISDA Conference  
25-28 October 2008
- APHA Conference  
25-29 October 2008
- HFETAG Meeting  
TBD Fall 2008

# Naval Health Research Center Quarterly Update

SPRING 2008

## Department of Respiratory Disease Research

The Respiratory Disease Laboratory at the Naval Health Research Center (NHRC) serves as the Navy hub for the Department of Defense Global Emerging Infections Surveillance and Response System (DoD-GEIS). With a wide range of respiratory pathogen diagnostic capabilities and expanding roles in conduct of clinical trials, the Department has served a critical and much-needed role within the DoD for over a decade.

Laboratory diagnostic capability was first established at NHRC in 1995 to serve the newly recognized need for adenovirus surveillance in our recruit training centers. Hiring research coordinators at each of the numerous recruit training centers was a strength of the surveillance network. In this manner, dependence on overly extended and frequently transient military personnel was minimized, and the network attained continuity over time. Coordinators collected both numerator and denominator information on recruits meeting the cases definition of a febrile respiratory illness, and a subset were sampled with a throat swab for



diagnostic testing here at NHRC. With these numbers, rates of illness could be followed over time. The laboratory processing at NHRC has a strong emphasis on Quality Assurance and is accredited by the College of American

Pathologists (CAP) with CLIP certification, thus permitting use of results for clinical diagnosis and management.

This program clearly demonstrated that loss of the adenovirus vaccines by early 1999 resulted in an increase of adenovirus-specific febrile illness rates to levels comparable to the pre-vaccine era. The DoD used these data to demonstrate that re-acquisition of the adenovirus vaccines was urgently needed.

Subsequently, the DoD found a new manufacturer in 2001, and phase 1, 2, and 3 trials were completed. FDA approval of the new product is expected in 2009, and will have a huge public health impact on this vulnerable population.

The success of this laboratory-based surveillance system continues to the present day. We will now

*(Continued on page 3)*

## Birth & Infant Health Registry (BIHR)

### A decade of work and still going strong!

Established in 1998, the U.S. Department of Defense (DoD) Birth and Infant Health Registry has been monitoring the health and well-being of military families for a decade. Led by the DoD Center for Deployment Health Research (Department 164) at Naval Health Research Center, San Diego, the DoD Birth and Infant Health Registry (Registry) captures comprehensive health care data to define live births and infant health outcomes through the first

year of life among children born to U.S. military families. With more than 90,000 infants born to U.S. military families worldwide each year, the Registry now includes data for approximately 750,000 infants.

In 10 years, the Registry research team has developed an unparalleled knowledge of the capabilities and limitations of the electronic military health care data available to explore reproductive health issues. Using this expertise,

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## Modeling Air Force Allowance Standards

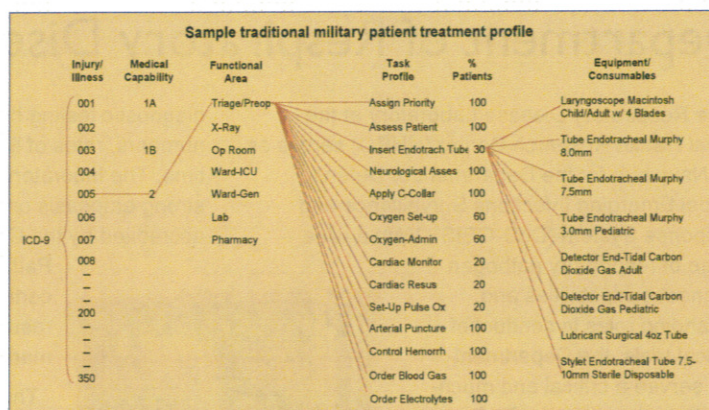
The U.S. Air Force (USAF) has teamed up with Naval Health Research Center (NHRC) to find a new paradigm for managing supply requisition. When NHRC helped the Marine Corps reconfigure its Authorized Medical Allowance Lists (AMALs), they developed a database called the Estimating Supplies Program, or ESP. Used for medical modeling, ESP was conceived as a tool to help medical planners and logisticians prepare for conflict and humanitarian missions, streamline medical materiel, manage supply inventory, and evaluate inventory readiness.

The ESP database maps injuries and illnesses to clinical tasks, and then correlates the tasks to supplies necessary to perform them. Every line item in the inventory is aligned to a task in a patient treatment profile. This mapping ensures each supply is present in the inventory based on its clinical requirement.

### Air Force Allowance Standard Reviews

USAF medical capabilities are grouped by Unit Type Codes (UTCs), which are modular and configured according to their

CONOPS. The USAF wanted to prepare capabilities ranging from routine outpatient care to treating critically injured or ill personnel, and supply configurations had to reflect the mobility and flexibility of their missions. Some UTCs stand alone; some add a specialty component and are augments supplementing other UTCs.



The first three UTCs selected were the Mobile Forward Surgical Team (MFST), the Critical Care Air Transport Team (CCATT), and the Global Reach Laydown (GRL). The MFST deploys with far-forward troops and performs 10 emergency life- and limb-saving surgeries or 20 resuscitative procedures; the CCATT provides en-route care; and the GRL provides limited medical support.

NHRC's modeling process includes a variety of subject matter experts (SMEs). At NHRC, research analysts Ralph Nix and Curt Hopkins, both former corpsmen, created the UTC models, generating patient streams and supply lists for the Air Force SMEs to review. The USAF SMEs help determine which line items are

(Continued on page 4)

## Awards

Congratulations to CDR Kevin Russell and CDR Dave Service on their selection to CAPTAIN.

CDR Kevin Russell has been selected as the next GEIS Director for the summer of 2008.

Congratulations to LCDR Karen Corson who was selected as the 2007 Navy Environmental Health Officer of the Year.

### Poster Awards at the 2008 NEHC Conference:



M. Balansay, et al., *An outbreak of Mycoplasma pneumoniae on USS Boxer (LHD4)* – Chosen as a finalist in Operational Research Commands; won 3rd place award for Research Commands; won 1st place award for Research Poster in

Preventive Medicine.

I. Jacobson, et al., *Health Outcomes Among Infants Born to Women Deployed in Support of the Wars in Iraq and Afghanistan* – won Best Environmental Programs Research poster.

A. Bukowski, et al., *Hemangiomas and Associated Birth Defects Among Infants Born to US Military Families* – won Best Health Promotion Research poster.

### Length of Service Awards:

Dick Booth and Rae Jackson for 40 years, Julie Olszower for 25 years, Hoa Ly for 20 years, and Gregory McCurtis and James Zouris for 10 years.

### Letter of Appreciation:

Dr. Karl Van Orden for outstanding support provided to Naval Medical Research Center that allowing them to meet a critical deadline in submitting approximately \$5 million in proposals to the DoD PTSD/TBI Research Program, managed by



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## Respiratory Disease (cont.)

be in place to clearly demonstrate a decline in adenovirus illness rates once the vaccination program resumes among our recruits.

The need for laboratory-based respiratory pathogen surveillance in other populations within the DoD was clear. From 2002 to present, our network has expanded to large-deck ships in the 2nd, 5th, and 7th Fleets, with 20 ships now participating. At present, there is only one FDA-approved test for the potential pandemic strain of influenza, H5. In order to use this test, however, a laboratory must be a part of the CDC Laboratory Response Network (LRN). The laboratories aboard ships generally cannot meet LRN expectations; however, given the current concerns over a pending influenza pandemic and exposure of naval ships throughout the world, the Department of Respiratory Disease Research agreed to provide oversight and facilitation approved by the CDC; and ships can now acquire this FDA-approved influenza H5 test. Surveillance has extended to 6 clinics along the US-Mexico border, in collaboration with the CDC, and to deployed settings such as Cobra Gold in Thailand. Our resources, unique within the DoD, are frequently used by the Armed Forces Institute of Pathology to assist in determining the responsible respiratory pathogen in undiagnosed deaths appearing to be respiratory in nature.

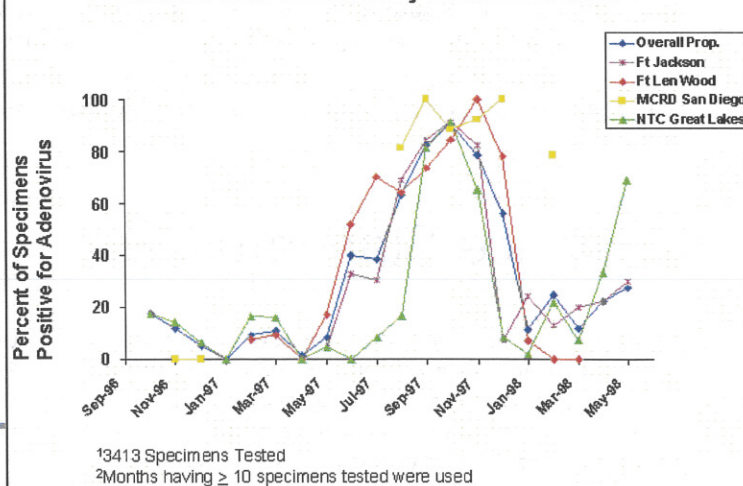
The archives of clinical samples collected over the past 13 years have proved to be an extremely valuable asset to the DoD. Extensively tested with CAP-accredited methodologies, these samples have been leveraged to test the performance of a wide variety of commercially available diagnostic tests, particularly for influenza and adenovirus. In-house expertise and ability to validate methodologies have resulted in a wide range of advanced diagnostics located at Naval Health Research Center. These include the DARPA-sponsored broad-spectrum diagnostic technology, the T5000, and the Air Force Surgeon General Epidemic Outbreak Surveillance (EOS) developed technology of re-sequencing microarrays (now independent of EOS, and commercially available through the company TessArae).

Outside the realm of respiratory pathogen surveillance and diagnosis, the Department of Respiratory Disease Research has conducted much basic research on molecular aspects of

adenovirus and influenza; hypothesis-driven research, such as the effect of azithromycin on respiratory illness rates in recruits, or potential contributions of environmental sources or recruit sequestering on the epidemiology and spread of adenovirus; and many clinical trials, most recently supporting the Phase 2/3 adenovirus vaccine trials at Great Lakes Recruit Training Command. Both the investigators and diagnostic laboratory support are compliant with FDA needs. Currently, the Department is supporting the extensive postmarketing Phase 4 trials the FDA requires for the newly licensed smallpox vaccine manufactured by Acambis. This study will enroll up to 20,000 subjects.

Our Department strives to serve our DoD customers through excellence in diagnostic testing and fleet-relevant clinical trials and research. We have grown to a department of over 50 professionals that includes 3 MDs and 3 PhDs. We hold ourselves to the highest standards, as illustrated by over 100 peer-reviewed publications coming from our work over the last 10 years. Respiratory pathogens continue to have an impact our populations; therefore, we cannot be content with past successes. We will continue to look for opportunities to provide our services to our brave men and women in uniform. No mission is ever unchanging over time. We look forward to adapting to the needs of the military of the future.

**Adenovirus Isolation by Site and Month**



## Awards (cont.)

US Army Medical Research and Materiel Command  
Congressionally Directed Medical Research Programs.

### On-the-Spot Awards:

Loretta Diehl for Fiscal Department data calls and APRS/FPS developments requiring information management skills well beyond the requirement of her position.

Dianna Hulse for high-quality Government Purchase Card Program and FISC's Purchase Card Audit.

### Special Achievement:

Jerry Blanco for renovations of the Building 329 atrium and approximately \$450K savings to the command for overhead.

Brian Nelson for his outstanding work with DTS, Urinalysis, and other duties assigned due to the vacancy in Admin.

Julie Olszower for NSPS Pay Pool Advisor and executing the POA&M on schedule, and ISIC preparation.



## Recent Publications & Presentations

Blyn LB, Hall TA, Libby B, Ranken R, Sampath R, Rudnick K, Moradi E, Desai A, Metzgar D, Russell KL, Freed NE, Balansay M, Broderick MP, Osuna MA, Hofstadler SA, Ecker DJ. Rapid detection and molecular serotyping of adenovirus using PCR followed by electrospray ionization mass spectrometry. *Journal of Clinical Microbiology* 2008;46(2):644-651.

Cranston MM, Ryan MAK, Smith TC, Sevick CJ. Comparison of Congenital Hypothyroidism Among Military Infants Born to Countries of Varied Iodine Intake and Nutrition Status. Annual San Diego Epidemiology Research Exchange, 2 May 2008, San Diego, CA.

Endara S, Ryan MAK, Sevick CJ, Conlin AM, Macera C, Smith TC, for the Department of Defense Birth and Infant Health Registry. Infant Health Outcomes After Maternal Stress Related to the Terrorist Attacks of September 11, 2001. Annual San Diego Epidemiology Research Exchange, 2 May 2008, San Diego, CA.

Galarneau MR, Woodruff SI, Dye JL, Mohrle CR, Wade AL. Traumatic brain injury during Operation Iraqi Freedom: findings from the United States Navy-Marine Corps Combat Trauma Registry. *Journal of Neurosurgery*. 2008 May;108(5):950-7.

Hill M, Pang G, Konoske P. Determining Medical Supply Needs of the Surgical Company Ward. San Diego, Calif: Naval Health Research Center; 2008. Document No. 08-2B

Hill M, Konoske P, Pang G. Determining Medical Supply Requirements for Combat Lifesaver and Vehicle Medical Kits. San Diego, Calif: Naval Health Research Center; 2008. Document No. 08-3C

Hill M, Konoske P, Pang G, Lowe D. Updating Clinical Requirements For the Surgical Company X-Ray And En Route Care AMALs. San Diego, Calif: Naval Health Research Center; 2008. Document No. 08-4D

Hooper TI, DeBakey SF, Nagaraj BE, Bellis KS, Smith B, Smith TC, Gackstetter GD. The Long-Term Hospitalization Experience Following Military Service in the 1991 Gulf War among Veterans Remaining on Active Duty, 1994-2004. *BMC Public Health* 2008; 8:60.

Larson GE, Highfill-McRoy RM, Booth-Kewley S. Psychiatric Diagnoses in Historic and Contemporary Military Cohorts: Combat Deployment and the Healthy Warrior Effect. *American Journal of Epidemiology*. 2008 Apr 23. [Epub ahead of print].

Ryan MA, Seward JF; Smallpox Vaccine in Pregnancy Registry Team. Pregnancy, birth, and infant health outcomes from the National Smallpox Vaccine in Pregnancy Registry, 2003-2006. *Clinical Infectious Diseases*. 2008 Mar 15;46(suppl 3):S221-S6.

Ryan MAK, Lloyd DW, Conlin AMS, Gumbs GR, Keenan HT. Evaluating the epidemiology of inflicted traumatic brain injury in infants of US military families. *American Journal of Preventative Medicine* 2008;34(4S):S143-S147.

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## Allowance Standards (cont.)

used and which are not. For the MFST review, for example, a general surgeon, an anesthesiologist, an orthopedic surgeon, a medical planner, and a logistician chose injuries that included multiple injury wounds, burns, amputations, crush injuries, and cerebral contusions. ESP linked the injuries to clinical tasks, and generated supply lists. ESP registered all changes, so if a supply were removed, all tasks using it appeared; SMEs could see the impact of its removal. The SMEs compared the supply list with the existing Allowance Standard, recommending deletions or inclusions, adjusting quantities, and modifying task profiles. They took into account changes in standard operating procedures, clinical practices, new equipment, and research-based improvements. The results were modest decreases in materiel weight, cube, and cost.

The modeling and simulation process is part of the USAF Force Development Evaluation (FDE) efforts to modernize existing UTCs. In addition to the evaluation of the Four-Bed Critical Care

Unit, Maxillofacial, Ear Nose and Throat, Pediatrics, and Gynecology UTCs, FDEs recently were done for the Emergency Medical Support System +10 and Small Portable Expeditionary Aeromedical Rapid Response capability. Martin Hill, a NHRC research analyst, is currently evaluating the Rapid Response Deployment Kit for the Air Force Special Operations Command.

Military operations today are especially complex: a joint force composed of both active and reserve components likely to be employed to carry out a mission. Standardizing medical supplies and nomenclature usage across services is essential to easing communication and seamlessly providing quality care in difficult or dangerous circumstances. The U.S. Air Force found a way to standardize its medical capabilities by employing a universal, customizable modeling and simulation methodology available to all of the services.



USAF C-130 Hercules



## BIHR (Cont.)



the Registry team can confidently examine militarily unique exposures to determine how they may have an impact on reproductive health. In recognition of this expertise, external agencies, such as the Military Vaccine

Agency, the Centers for Disease Control and Prevention, and the DoD Family Advocacy Program, have contacted the Registry to consult and collaborate on a variety of projects relevant to reproductive and infant health.

The Registry team works to ensure the relevance of Registry data to the DoD mission of Force Health Protection. In FY06 and FY07, the team submitted proposals for competitive funding through the DoD Congressionally Directed Medical Research Programs/ Peer Review Medical Research Program. The Registry proposals were among the few accepted for funding. The FY06 proposal evaluated health outcomes among infants born to Operations Iraqi and Enduring Freedom deployers; analyses are under way. The FY07 proposal joins data from the Registry and the Millennium Cohort Study to evaluate what impact parental

stress, and PTSD in particular, has on infant health. Combining these projects allows the Registry team to distinguish the impact stress has on infant health, while controlling for known confounders, such as alcohol and tobacco use.

A strength of the Registry is the ability to quickly adapt to the changing needs of the DoD. In late 2002, the DoD implemented a compulsory smallpox vaccination policy. To address this occupational exposure, the team created the National Smallpox Vaccine in Pregnancy Registry, enrolling women vaccinated while pregnant and following them to determine fetal outcomes, such as pregnancy losses and fetal vaccinia. When the DoD began using the Acambis smallpox vaccine earlier this year, the team modified forms to capture relevant data. Additional vaccines in pregnancy research include evaluations of infertility following smallpox vaccination, and pregnancy outcomes following anthrax vaccination.

The Registry team is poised to address existing and future reproductive health concerns, as well as continue to provide important reproductive health surveillance on the geographically dispersed military population. This program complements civilian public health programs and is especially valuable to military members and their families.

## Recent Publications & Presentations (cont.)

Smith B, Wong C, Smith TC, Ryan MAK, Boyko E, Gray G, Gackstetter G, for the Millennium Cohort Study Team. New-onset of Chronic Respiratory Illnesses among Military Personnel Deployed to Iraq and Afghanistan. Annual San Diego Epidemiology Research Exchange, 2 May 2008, San Diego, CA.

Smith TC, Ryan MA, Wingard DL, Slymen DJ, Sallis JF, Kritz-Silverstein D. New onset and persistent symptoms of post-traumatic stress disorder self reported after deployment and combat exposures: prospective population based US military cohort study. *BMJ* 2008;336(7640):366-71.

Smith TC, Wingard DL, Ryan MA, Kritz-Silverstein D, Slymen DJ, Sallis JF; Millennium Cohort Study Team. Prior assault and posttraumatic stress disorder after combat deployment. *Epidemiology*. 2008 May;19(3):505-12.

Stander VA, Merrill LL, Thomsen CJ, Crouch JL, Milner JS. Premilitary Adult Sexual Assault Victimization and Perpetration in a Navy Recruit Sample. *Journal of Interpersonal Violence*. 2008 Mar 4. [Epub ahead of print].

Taylor MK, Reis JP, Sausen KP, Padilla GA, Markham AE, Potterat EG, Drummond SP. Trait anxiety and salivary cortisol during free living and military stress. *Aviation Space & Environmental Medicine*. 2008 Feb;79(2):129-35.

Welch KE, Farnell LE, LeardMann CA, Jacobson IG, Wong CA, Smith B, Smith TC, for the Millennium Cohort Study Team. The Millennium Cohort Study: A 21-year Contribution to the Understanding of Military Health. 26th Annual San Diego Epidemiology Research Exchange, 2 May 2008, San Diego, CA.

Welch KE, LeardMann CA, Jacobson IG, Speigle SJ, Smith B, Ryan MAK, Smith TC, for the Millennium Cohort Study Team. Do Semiannual Postcards Have Value in a Long-Term Study? Analysis of Address Updates After Postcard Contact. 26th Annual San Diego Epidemiology Research Exchange, 2 May 2008, San Diego, CA.

Wells TS, Jacobson IG, Smith TC, Spooner CN, Smith B, Reed RJ, Amoroso PJ, Ryan MA. Prior health care utilization as a potential determinant of enrollment in a 21-year prospective study, the Millennium Cohort Study. *European Journal of Epidemiology* 2008;23(2):79-87.

Zimmermann L, Smith B, Slymen D, Ryan MAK, Wells TS, Smith TC, for the Millennium Cohort Study Team. Individual Assignment in Military Deployment and Self-reported Mental Health Morbidity: A Longitudinal Analysis of a Large Population-based Cohort. Annual San Diego Epidemiology Research Exchange, 2 May 2008, San Diego, CA.



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## Command Corner



**CAPT Kerry Thompson**  
Commanding Officer

Many of you may be unaware that LCDR Karen Corson was selected as the CAPT George M. Hansel Environmental Health Officer (EHO) of the Year, an award designated to recognize the Navy EHO who exhibits the highest Navy Core Values: professionalism, initiative, leadership, and dedication to the practice of Navy Environmental Health. We are honored to have such dedicated officers at our command and proud of her accomplishment. LCDR Corson was chosen from among five other finalists across the Navy. During this time,

LCDR Corson was deployed to the Combined Joint Task Force-Horn of Africa (CJTf-HOA) from January 2007 – February 2008. While deployed, she was the Force Health Protection Officer for CJTF-HOA, responsible for the health and well-being of forward-deployed troops. Her work included areas such as food safety, potable water, habitability of berthing areas, waste, wastewater disposal, hazardous materials/waste, and medical intelligence in addition to environmental surveillance. Upon her return from deployment, LCDR Corson assured me it was a great experience working on health issues and long-term environmental issues, not only with CJTF-HOA, but also with Camp Lemonnier's Environmental and Safety Officers and the Djiboutian Ministries (of Environment and Health). Working hand-in-hand, not only with her American colleagues, but also with her Eastern African colleagues, toward one goal—the health of people—was a unique opportunity. While her mission was by no means easy, she assured me it was meaningful.

While deployed we missed the

opportunity to promote her to the rank of LCDR. As

you may remember, she was wearing the "railroad tracks" of a Lieutenant prior to her departure from NHRC. LCDR Corson has a wealth of international experience. She was raised in Latin America by her missionary parents. She joined the Navy after completing her Ph.D. in Epidemiology and brings an incredible array of practical experience, knowledge, and talent to the field. Her understanding of cultural issues led her to work more closely with local communities in setting up cholera camps as well as working on a local level to establish national guidelines for environmental issues. LCDR Corson is the consummate Navy Medicine professional who superbly represents both the Medical Service Corps and the Environmental Health Officer communities. We are fortunate to have her on our staff. Take a few minutes to talk to her about her recent deployment experience. I'm pressing her to give a seminar about it as well.

